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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/868,716	06/20/2001	Jurgen Beyerer	34691/234885	3478

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EXAMINER

YAM, STEPHEN K

ART UNIT PAPER NUMBER

2878

DATE MAILED: 05/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/868,716

Applicant(s)

BEYERER ET AL.

Examiner

Stephen Yam

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 30-34, 36-40, 42 and 45-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-34, 36-40, 42 and 45-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 3, 2003 has been entered.

Claims 30-34, 36-40, 42, and 45-47 are still pending. Since Claim 43 was cancelled in a prior response, the most recent amendment for Claim 43 is not considered.

Claim Objections

2. Claim 30 is objected to because of the following informalities:
In Claim 30, line 6-7, "the core or core packet" should be replaced by "each shot core or core packet" for proper antecedent basis.
Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 30-34, 42, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabatabaei US Patent No. 5,757,506 in view of Pöhlandt US Patent No. 5,996,681.

Regarding Claims 30, 31, 33, 34, 42, and 45, Tabatabaei teaches (see Fig. 1) a method of detecting defects on molds used in the foundry industry (see Col. 1, lines 8-13 and 15-17) comprising illuminating (18) each mold by at least two light sources (18) from different directions and so as to produce shadows (see Col. 2, lines 44-46) which magnify an area of each mold, recording by means of a camera (10) each illuminated mold and the shadows resulting from the illumination (see Col. 2, lines 44-46 and Col. 4, lines 25-30) to thereby produce recorded data which comprise a recorded image (see Col. 2, lines 47-62), and processing the recorded data in a computer (22) and including processing the recorded image by comparing the recorded image with a record of reference data (see Col. 2, lines 65-67 and Col. 4, lines 12-23). Tabatabaei also teaches the shadows as clearly defined and distinguishing (see Col. 4, lines 25-30)- therefore, inherently, the shadows are a magnification of the notch so that it is clearly detected. Regarding Claim 31, Tabatabaei teaches (see Fig. 1) the camera arranged at a fixed location. Regarding Claim 33, Tabatabaei teaches (see Fig. 1) the processing step including exchanging signals (see Col. 3, lines 3-10) between the computer and a stored program control (26). Regarding Claim 34, Tabatabaei teaches (see Col. 2, lines 61-67) the further step of performing a qualitative or quantitative image evaluation on the recorded image. Regarding Claim 42, Tabatabaei teaches the image processing step comprising a defect detection (see Col. 4, lines 66-65). Regarding Claim 45, Tabatabaei also teaches the processing step further includes a brightness adjustment (see Col. 5, lines 29-34) for adapting the gray-scale values of the image. Tabatabaei does not teach detecting defects in shot cores or core packets. Pöhlandt

teaches (see Fig. 1) a method for detecting defects in a shot core (3) or core packet in the foundry industry by capturing (5) and analyzing (6) an image. It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect defects in a shot core or core packet as taught by Pöhlandt in the method of Roy et al., to provide non-contacting defect detection and scanning for quality control in shot cores/core packets, as taught by Pöhlandt (see Col. 4, lines 65-67).

Regarding Claim 32, Tabatabaei in view of Pöhlandt teach the method in Claim 30, according to the appropriate paragraph above. Tabatabaei and Pöhlandt do not teach the camera including a lens and the camera encased at least in the region of the lens. It is well known in the art that a camera includes a lens to properly focus an image onto an internal imaging element and is encased to protect the imaging element from receiving external light. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a lens in the camera and to encase the camera at least in the region of the lens in the method of Tabatabaei in view of Pöhlandt, to properly receive images on the camera and prevent external light from adversely affecting the imaging on the camera.

5. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tabatabaei in view of Pöhlandt as applied to Claim 30, further in view of Sacks et al. US Patent No. 4,736,437.

Tabatabaei in view of Pöhlandt teach the method in Claim 30, according to the appropriate paragraph above. Tabatabaei and Pöhlandt do not teach the comparing step including a coarse correlation with the recording data. Sacks et al. teach an image processing method with processing a recorded image from recorded data and comparing it with a record of

reference data (see Col. 1, lines 9-13 and Col. 2, lines 60-63), wherein the comparing includes a coarse correlation with the recording data (see Col. 1, lines 43-56 and Col. 4, lines 30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a coarse correlation with the recording data as taught by Sacks et al. in the method of Tabatabaei in view of Pöhlandt, to reduce processing time and provide a high-speed and accurate comparison as taught by Sacks et al. (see Col. 1, lines 9-13 and 21-25).

6. Claims 37-40, 46, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabatabaei in view of Pöhlandt as applied to Claim 30, further in view of Raviv US Patent No. 4,873,651.

Regarding Claims 37-40, Tabatabaei in view of Pöhlandt teach the method in Claim 30, according to the appropriate paragraph above. Regarding Claim 38, Tabatabaei teaches the image processing step including a position correction (see Col. 3, lines 1-13). Regarding Claim 39, Tabatabaei teaches the position correction including recording reference marks ("notch"- see Col. 3, lines 1-13 and Col. 4, lines 17-23). Regarding Claim 40, Tabatabaei teaches the reference marks as lines and/or dots (see Col. 2, lines 29-31) on a base (side of (16)). Tabatabaei and Pöhlandt do not teach the recording step including recording at least two images which are processed in the processing step. Raviv teaches (see Fig. 1B) a method for imaging the surface of an object (1) comprising illuminating the object by at least two light sources (6) from different directions so as to produce shadows (see Fig. 1A and Col. 2, lines 40-52), recording by means of a camera (3) each object and the shadows resulting from the illumination to produce recorded data which comprise a recorded image (see Col. 5, lines 56-58 and Col. 6, lines 4-7), and

processing the recorded data in a computer (4), wherein the recording step includes recording at least two images which are processed in the processing step (see Col. 5, lines 9-13 and 17-20 and Col. 6, lines 1-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to record at least two images which are processed in the processing step as taught by Raviv in the method of Tabatabaei in view of Pöhlandt, to produce multiple shadow images to obtain different shadow projections to provide improved detection of the notch.

Regarding Claim 46, Tabatabaei in view of Pöhlandt teach the method in Claim 30, according to the appropriate paragraph above. Tabatabaei and Pöhlandt do not teach the at least two light sources operated in sequence. Raviv teaches (see Fig. 1B) a method for imaging the surface of an object (1) comprising illuminating the object by at least two light sources (6) from different directions so as to produce shadows (see Fig. 1A and Col. 2, lines 40-52), recording by means of a camera (3) each object and the shadows resulting from the illumination to produce recorded data which comprise a recorded image (see Col. 5, lines 56-58 and Col. 6, lines 4-7), and processing the recorded data in a computer (4), wherein the at least two light sources are operated in sequence (see Col. 2, lines 58-64 and Col. 6, lines 1-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to operate the two light sources in sequence as taught by Raviv in the method of Tabatabaei in view of Pöhlandt, to produce multiple shadow images to obtain different shadow projections to provide improved detection of the notch.

Regarding Claim 47, Tabatabaei in view of Pöhlandt teach the method in Claim 30, according to the appropriate paragraph above. Tabatabaei and Pöhlandt do not teach the at least two light sources operated with color differentiation. Raviv teaches (see Fig. 1B) a method for

imaging the surface of an object (1) comprising illuminating the object by at least two light sources (6) from different directions so as to produce shadows (see Fig. 1A and Col. 2, lines 40-52), recording by means of a camera (3) each object and the shadows resulting from the illumination to produce recorded data which comprise a recorded image (see Col. 5, lines 56-58 and Col. 6, lines 4-7), and processing the recorded data in a computer (4), wherein the at least two light sources are operated with color differentiation (see Col. 8, lines 33-37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to operate the two light sources with color differentiation as taught by Raviv in the method of Tabatabaei in view of Pöhlandt, to obtain and record multiple shadow projections simultaneously, as taught by Raviv (see Col. 8, lines 33-37).

Response to Arguments

7. Applicant's arguments with respect to claims 30-34, 36-40, 42, and 45-47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

SY

SY
May 16, 2003


DAVID PORTA
SUPERVISORY PATENT EXAMINER
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